Agilent U2802A 31-Channel Thermocouple Input Device

Quick Start Guide

Agilent Technologies

Safety Information

This 31-channel thermocouple input device is safety-certified in compliance with:

- IEC 61326:2002 / EN 61326:1997+A1:1998+A2:2001+A3:2003
- CISPR 11: 1990/EN55011:1990 [Radiated emission]
- CANADA: ICES-001: 2004
- Australia/New Zealand: AS/NZS CISPR11:2004

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

- Do not use the device if it is damaged. Before you use the device, inspect the case. Look for cracks or missing plastic. Do not operate the device around explosive gas, vapor or dust.
- Do not apply more than the rated voltage between terminals, or between terminal and external ground.
- Always use the device with the cables provided.
- Observe all markings on the device before connecting to the device.
- Turn off the device and application system power before connecting to the I/O terminals.
- When servicing the device, use only specified replacement parts.
- Do not operate the device with the removable cover removed or loosened.
- Do not connect any cables and terminal block prior to performing self-test process.
- Use only the power adapter supplied by the manufacturer to avoid any unexpected hazards.

CAUTION

- Do not load the input and output terminals above the specified operating limits. Input terminals should not exceed ±10 V with respect to the module ground.
- Applying excessive voltage or overloading the device will cause irreversible damage to the circuitry.
- Applying excessive voltage or overloading the input terminal will damage the device permanently.
- If the device is used in a manner not specified by the manufacturer, the protection provided by the device may be impaired.
- The U2802A can only be used with U2355A or U2356A DAQs and used with the SCSI cables provided.
- Always use dry cloth to clean the device. Do not use ethyl alcohol or any other volatile liquid to clean the device.
- Do not permit any blockage of the ventilation holes of the device.

Regulatory Markings

	The CE mark is a registered trademark of the European community. This CE mark shows that the product complies with all the relevant European legal directive.
ICES/NMB-001	ICES/NMB-001 indicates that this ISM device complies with Canadian ICES-001.
	The CSA mark is a registered trademark of the Canadian Standards Association. A CSA mark with the indicators "C" and "US" means that the product is certified for both the U.S. and Canadian markets, to the applicable American and Canadian standards.
	The C-tick mark is a registered trademark of the Spectrum Management Agency of Australia. This signifies compliance with the Australian EMC Framework regulations under the terms of the Radio Communications Act of 1992.
	This product complies with the (2002/96/EC) marking equipment. The affixed product label indicates that you must not disgard this electrical/electronic product in domestic household waste.

Safety Symbols

	Direct current
	Alternating current
	Both direct and alternating current
	Three-phase alternating current
	Earth (ground) terminal
	Protective conductor terminal
	Frame or chassis terminal
	Equipotentiality
	On (Supply)
	Off (Supply)
	Equipment protected throughout by double insulation or reinforced insulation
	Caution, risk of electric shock
	Caution, hot surface
	Caution, risk of danger (See note.)
	In position of a bi-stable push control
	Out position of a bi-stable push control

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Introduction to Agilent U2802A

The Agilent U2802A 31-Channel Thermocouple Input is a thermocouple input device that functions to convert low input voltage signal (< ±100 mV) from a thermocouple into an output voltage range suitable for data acquisition (DAQ) device (± 10 V).

Agilent U2802A thermocouple is to be used in conjunction with the U2355A and U2356A model DAQ to enable a wide range of sensor input measurements.

It works as a standalone device attached to a single DAQ. The U2802A thermocouple device is connected to the modular DAQ via SCSI cables. Agilent U2802A accepts eight standard thermocouple types defined in the NIST ITS-90 Thermocouple Database, which are Type B, E, J, K, N, R, S and T.

It is ideal for a broad variety of temperature and voltage measurement applications in education, industrial and scientific environments. The U2802A comes with an on-board EEPROM features. Hence, it allows user to store calibration data in volatile memory. Therefore, the U2802A is robust, cost-effective, and user friendly device.

This quick start guide provides an overview of the U2802A 31-channel thermocouple input device. The step-by-step instructions to install the hardware driver and Agilent Measurement Manager application software are covered in this guide to help you get started.

Standard Purchase Items Checklist

Inspect and verify that you have all the following items upon standard purchase of U2802A 31-channel thermocouple input device. If there are missing items, contact the nearest Agilent Sales Office.

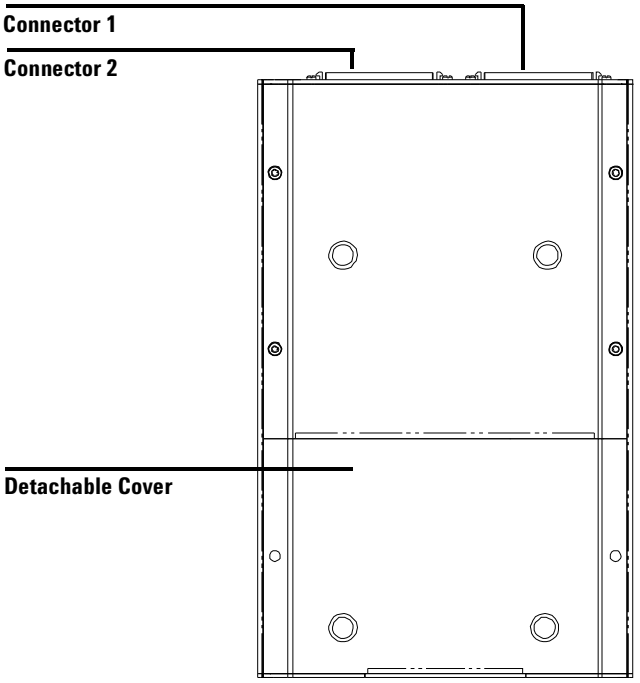
- ✔ Agilent U2802A 31-channel thermocouple input device
- ✔ Power supply splitter
- ✔ Two 68-pin SCSI cables (1 m)
- ✔ One J-type thermocouple
- ✔ Quick Start Guide
- ✔ Product Reference CD-ROM
- ✔ Agilent Automation-Ready CD (contains the Agilent IO Libraries Suite)
- ✔ Certificate of Calibration

WARNING **Use only the power adaptor provided by manufacturer to avoid unexpected hazard.**

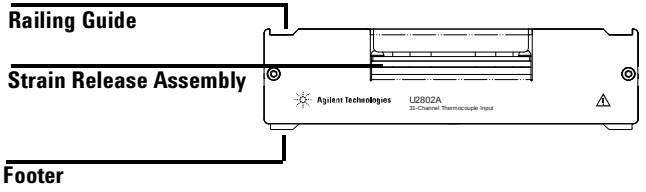
Product Overview

Product Outlook

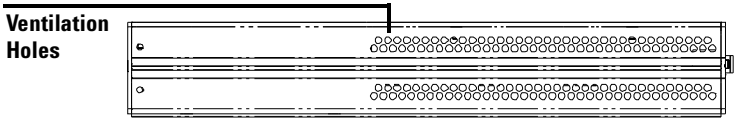
Top View



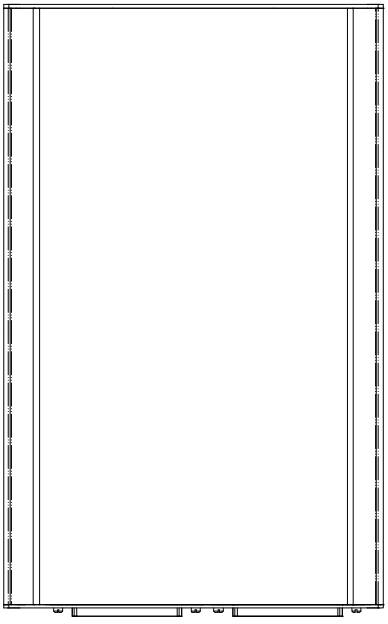
Front View



Side View



Bottom View



General Specifications

POWER CONSUMPTION
- ±12 VDC, 750 mA maximum

OPERATING ENVIRONMENT
- Operating temperature from 0 °C to 55 °C
- Relative humidity at 50% to 85% RH (non-condensing)
- Altitude up to 2000 meters

STORAGE COMPLIANCE
- –40 °C to 70 °C

SAFETY COMPLIANCE

Certified with:
- IEC 61010-1:2001/EN 61010-1:2001 (2nd Edition)

EMC COMPLIANCE
- IEC 61326-1:2002 / EN 61326-1:1997+A1:1998+A2:2001+A3:2003
- CISPR 11:1990/EN55011:1990 – Group 1, Class A
- CANADA: ICES-001: 2004
- Australia/New Zealand: AS/NZS CISPR11:2004

SHOCK & VIBRATION
- Tested to IEC/EN 60068-2

IO CONNECTOR
- 2 x 68-pin female SCSI connector
- 2 x 34-pin screw terminal block
- 1 x 24 pin screw terminal block

DIMENSIONS (WxDxH)
- 159.7 mm x 254.2 mm x 40.5 mm

WEIGHT
- 1.036 KG

WARRANTY
- Three years

Installations and Configurations

The U2802A is used in conjunction with the U2355A and U2356A DAQ. If you are using the U2300A Series with the Agilent Measurement Manager, follow the step-by-step instructions as shown in the following flowchart.

NOTE

- If you do not wish to specifically use the U2300A Series with the Agilent Measurement Manager software, and use the DAQ devices with Agilent VEE, LabVIEW or Microsoft Visual Studio only, you can skip steps E and I in the following flowchart.
- You need to install IVI-COM driver before using the U2300A Series with Agilent VEE, LabVIEW or Microsoft Visual Studio.
- If you have installed and currently using the U2300A Series, you may skip the initial steps and proceed to step H for U2802A Thermocouple Input installation in the following flowchart. Make sure Agilent Measurement Manager version 1.4 and above is installed before you proceed.

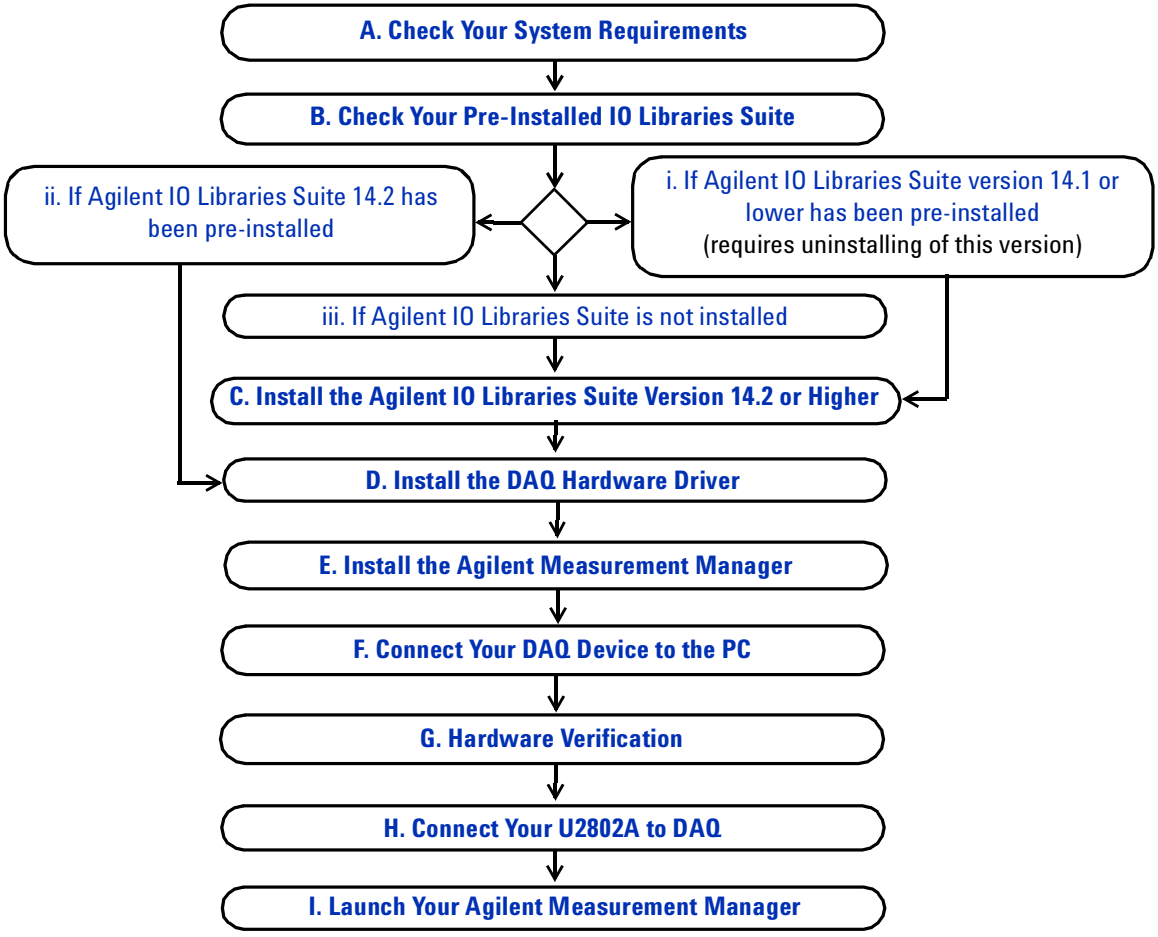

A. Check Your System Requirements
B. Check Your Pre-Installed IO Libraries Suite
ii. If Agilent IO Libraries Suite 14.2 has been pre-installed
i. If Agilent IO Libraries Suite version 14.1 or lower has been pre-installed (requires uninstalling of this version)
iii. If Agilent IO Libraries Suite is not installed
C. Install the Agilent IO Libraries Suite Version 14.2 or Higher
D. Install the DAQ Hardware Driver
E. Install the Agilent Measurement Manager
F. Connect Your DAQ Device to the PC
G. Hardware Verification
H. Connect Your U2802A to DAQ
I. Launch Your Agilent Measurement Manager

Figure 1 U2802A installation flowchart

A. Check Your System Requirements

Before installing the Agilent Measurement Manager software and DAQ hardware driver, make sure your PC meets the following minimum system requirements for installation and data acquisition.

Processor 1.6 GHz Pentium IV or higher

Operating system One of the following Microsoft Windows versions: Windows XP Professional or Home Edition (Service Pack 1 or later), Windows 2000 Professional (Service Pack 4 or later)

Browser Microsoft Internet Explorer 5.01 or higher

Available RAM 512 MB or higher is recommended

Hard disk space 1 GB

Pre-requisite Agilent IO Libraries Suite 14.2[1] or higher, Agilent T&M Toolkit 2.1 Runtime version[2], Agilent T&M Toolkit Redistributable Package 2.1 patch[2], Microsoft .NET Framework version 1.1 and 2.0[2]

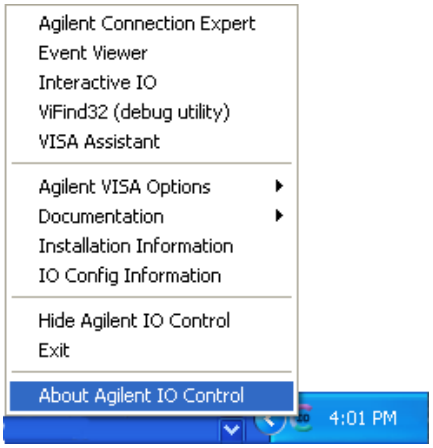
1 Available in Agilent Automation-Ready CD.

2 Bundled with Agilent Measurement Manager application software installer.

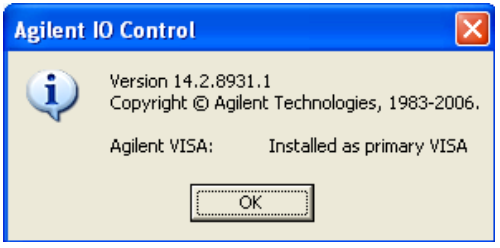
B. Check Your Pre-Installed IO Libraries Suite

To check the version of your pre-installed IO Libraries Suite, follow the instructions below.

1 Right-click IO Control icon on your taskbar notification area and the context menu will appear as shown below. Select **About Agilent IO Control**.



2 Agilent IO Control window will appear and the version of installed IO Libraries Suite will be displayed as shown below.



NOTE

If the Agilent IO Control icon is not visible on the taskbar notification area it may indicates that,

- you do not have the Agilent IO Libraries installed, or
- you have hidden the Agilent IO Control icon from the taskbar notification area.

To activate the icon, go to **Start > All Programs > Agilent IO Libraries Suite > Utilities > IO Control**. You will now see the Agilent IO Control icon appear on your taskbar notification area.

i. If Agilent IO Libraries Suite version 14.1 or lower has been pre-installed

If you have Agilent IO Libraries Suite version 14.1 or lower installed on your PC, you are required to uninstall the IO Libraries Suite.

1. To perform uninstallation, go to **Start > Control Panel > Add or Remove Programs**. The Add or Remove Programs window will appear. Select Agilent IO Libraries Suite 14.1 or lower version.
2. Click **Change/Remove** and select **Remove** when the instructions on the screen prompted to proceed uninstalling the IO Libraries Suite version 14.1 or lower from your PC.
3. Proceed to **C. Install the Agilent IO Libraries Suite Version 14.2 or Higher**.

ii. If Agilent IO Libraries Suite 14.2 has been pre-installed

If you have the IO Libraries Suite 14.2 pre-installed on your PC, skip Step C and proceed to **D. Install the DAQ Hardware Driver**

iii. If Agilent IO Libraries Suite is not installed

If you do not have IO Libraries Suite installed on your PC, go to **C. Install the Agilent IO Libraries Suite Version 14.2 or Higher**.

C. Install the Agilent IO Libraries Suite Version 14.2 or Higher

The Agilent IO Libraries Suite 14.2 is available in the *Agilent Automation-Ready CD* that comes with the standard purchase of Agilent U2300A Series USB Multifunction Data Acquisition Devices or U2802A 31-Channel Thermocouple Input.

NOTE

- If you do not have the *Agilent Automation-Ready CD*, obtain the Agilent IO Libraries Suite 14.2 or higher at http://www.agilent.com/find/iolib.
- Ensure that you do not have any USB DAQ device connected to your PC during installation of the Agilent IO Libraries Suite.

1 Disconnect any USB DAQ device that is connected to your PC and close all other applications on your PC.

2 Insert the *Agilent Automation-Ready CD* into your CD-ROM drive, and follow the instructions on your screen.

3 If the installation does not start automatically, go to **Start > Run** (on the Windows start menu) and type `<drive>:\autorun\auto.exe` where `drive` is your CD-ROM drive.

4 If you obtain the Agilent IO Libraries Suite from the web, save the self-extracting zip file (*.exe) to any location on your hard disk.

5 Double-click the installation file to launch the installation.

6 Follow the instructions on your screen to proceed with the installation.

7 After the installation is completed, you will see the IO Control icon on the Windows taskbar notification area as shown below.

NOTE For detailed installation instructions, refer to the *Agilent IO Libraries Suite Getting Started Guide* at http://www.agilent.com/find/iolib.

D. Install the DAQ Hardware Driver

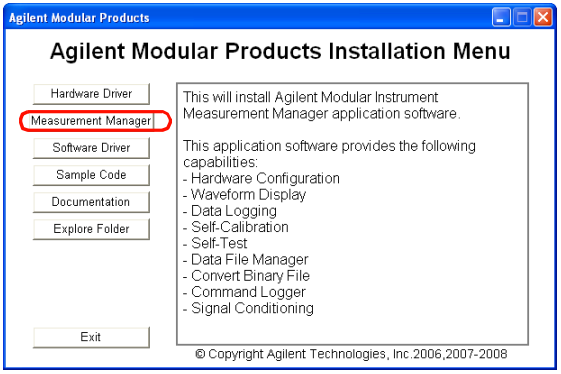
NOTE Refer to *Agilent U2300A Series USB Multifunction Data Acquisition Devices User's Guide* for DAQ hardware driver installation procedure.

E. Install the Agilent Measurement Manager

NOTE Make sure Agilent Measurement Manager version 1.4 and above is installed before U2802A is used.

1 Verify that you have the hardware driver installed. If not, close all other applications on your PC and insert the *Product Reference CD-ROM* into your CD-ROM drive.

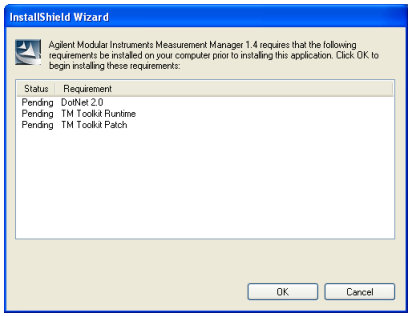
2 Click **Measurement Manager** on the Agilent Modular Products Installation Menu to begin the installation.



3 If the installation menu does not appear after a few seconds, go to **Start > Run** and type `<drive>:\Application\Modular Instruments Measurement Manager\setup.exe`, where `drive` is your CD-ROM drive.

4 Click **OK** to begin installation.

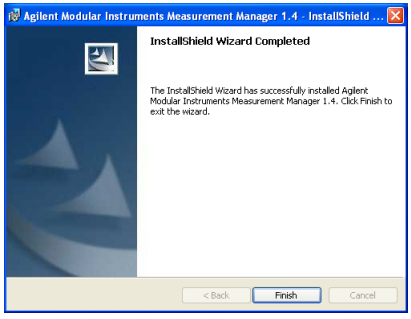
5 If you do not have the Agilent T&M Toolkit 2.1 Runtime version and/or Microsoft .NET Framework version 1.1 and 2.0 installed, the InstallShield Wizard software pre-requisite will appear as shown below.



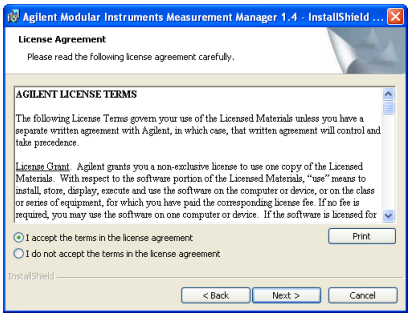
6 Click **OK** to begin installation of the listed missing software.

7 Once the above installation is completed, installation of the Agilent Measurement Manager software will proceed as normal

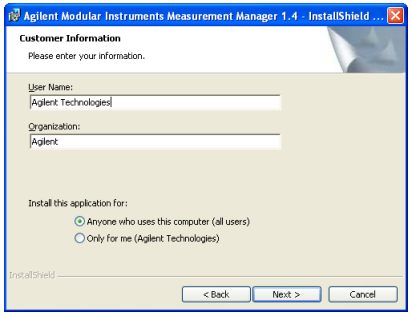
8 The Agilent Measurement Manager InstallShield Wizard dialog box will appear as shown below. Click **Next** to begin.


Agilent Modular Instruments Measurement Manager 1.4 - InstallShield ...
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed Agilent Modular Instruments Measurement Manager 1.4. Click Finish to exit the wizard.
< Back
Finish
Cancel

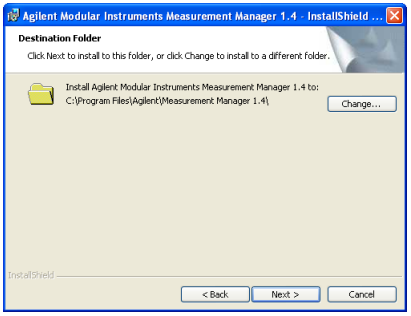
9 Read the License Agreement and select **I accept the terms in the License Agreement** to proceed. You may click **Print** to print a hardcopy of the Agilent License Terms for reference. Click **Next** to proceed.


Agilent Modular Instruments Measurement Manager 1.4 - InstallShield ...
License Agreement
Please read the following license agreement carefully.
AGILENT LICENSE TERMS
The following License Terms govern your use of the Licensed Materials unless you have a separate written agreement with Agilent, in which case, that written agreement will control and take precedence.
License Grant. Agilent grants you a non-exclusive license to use one copy of the Licensed Materials. With respect to the software portion of the Licensed Materials, "use" means to install, store, display, execute and use the software on the computer or device, or on the class or series of equipment, for which you have paid the corresponding license fee. If no fee is required, you may use the software on one computer or device. If the software is licensed for
I accept the terms in the license agreement
I do not accept the terms in the license agreement
Print
InstallShield
< Back
Next >
Cancel

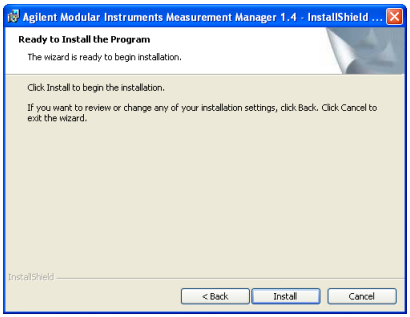
10 Fill in the Customer Information form, as shown below, accordingly and click **Next**.



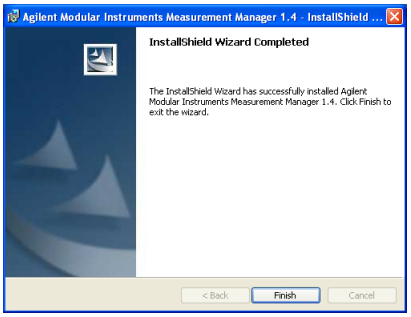
11 Click **Next** to install to the folder specified or click **Change** to install to a different folder.


Agilent Modular Instruments Measurement Manager 1.4 - InstallShield ...
Destination Folder
Click Next to install to this folder, or click Change to install to a different folder.
Install Agilent Modular Instruments Measurement Manager 1.4 to:
C:\Program Files\Agilent\Measurement Manager 1.4\
Change...
InstallShield
< Back
Next >
Cancel

12 Click **Install** to begin the installation of Agilent Measurement Manager.


Agilent Modular Instruments Measurement Manager 1.4 - InstallShield ...
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

13 Click **Finish** when the installation has completed.


Agilent Modular Instruments Measurement Manager 1.4 - InstallShield ...
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed Agilent Modular Instruments Measurement Manager 1.4. Click Finish to exit the wizard.
< Back
Finish
Cancel

14 A shortcut to this software will be created on your desktop.

NOTE USING THE LICENSED MATERIALS INDICATES YOUR ACCEPTANCE OF THE LICENSE TERMS. IF YOU DO NOT AGREE TO ALL OF THESE TERMS, YOU MAY RETURN ANY UNOPENED LICENSED MATERIALS FOR A FULL REFUND. IF THE LICENSED MATERIALS ARE BUNDLED OR PRE-LOADED WITH ANOTHER PRODUCT, YOU MAY RETURN THE ENTIRE UNUSED PRODUCT FOR A FULL REFUND.

F. Connect Your DAQ Device to the PC

NOTE

Refer to *Agilent U2300A Series USB Multifunction Data Acquisition Devices User's Guide* for "Connect Your DAQ Device to PC" procedure.

The bundled power supply splitter in U2802A is used to allow powering both the U2802 and U2355/56A DAQ with a single DC power adapter which has been supplied with the DAQ.

G. Hardware Verification

NOTE

Refer to *Agilent U2300A Series USB Multifunction Data Acquisition Devices User's Guide* for "Hardware Verification" procedure.

H. Connect Your U2802A to DAQ

1. Connect U2802A to U2355/56A DAQ using two 68-pin SCSI cables.
2. Connect 12V DC power supply to the power jack on the rear panel of the U2802A and the U2355/56A DAQ with the bundled power supply splitter.
3. Power on U2355A or U2356A DAQ.

I. Launch Your Agilent Measurement Manager

NOTE

- The Agilent IO Control will launch automatically when you start your PC.
- Launching Agilent Measurement Manager without Agilent IO Control running will cause Agilent Measurement Manager to fail from detecting or establishing any connection with the USB DAQ device connected to your PC.
- To run Agilent IO Control, go to **Start > All Programs > Agilent IO Libraries Suite > Utilities > IO Control**.

1 Double-click the Agilent Measurement Manager software icon on your desktop or go to **Start > All Programs > Agilent > Measurement Manager > Agilent Measurement Manager** to launch the software.

2 The Agilent Measurement Manager welcome screen will appear as shown below.

3 The Select USB Device dialog box will appear and shows the connected DAQ devices. To start the application, select a DAQ device and click **OK** to establish the connection.

NOTE

For more information on how to use the Agilent Measurement Manager, refer to the *Agilent Measurement Manager Help File*.

www.agilent.com

Contact us

To obtain service, warranty or technical assistance, contact us at the following phone or fax numbers:

United States:
(tel) 800 829 4444 (fax) 800 829 4433
Canada:
(tel) 877 894 4414 (fax) 800 746 4866
China:
(tel) 800 810 0189 (fax) 800 820 2816
Europe:
(tel) 31 20 547 2111
Japan:
(tel) (81) 426 56 7832 (fax) (81) 426 56 7840
Korea:
(tel) (080) 769 0800 (fax) (080) 769 0900
Latin America:
(tel) (305) 269 7500
Taiwan:
(tel) 0800 047 866 (fax) 0800 286 331
Other Asia Pacific Countries:
(tel) (65) 6375 8100 (fax) (65) 6755 0042

Or visit Agilent World Wide Web at:
www.agilent.com/find/assist

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Second Edition, September 7, 2009

U2802-90024

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